

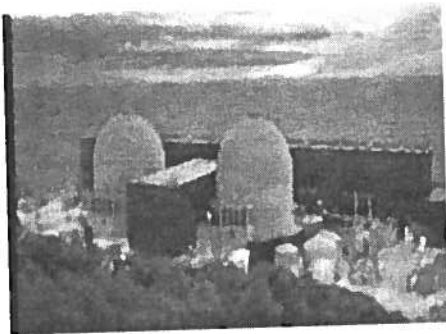
Michigan Energy Introduction

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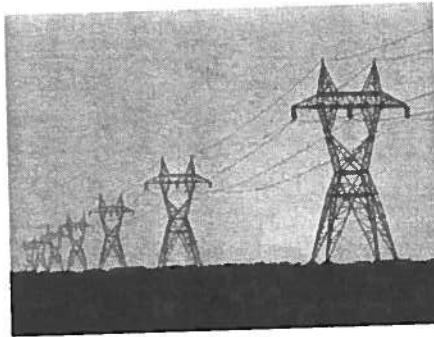


Electricity

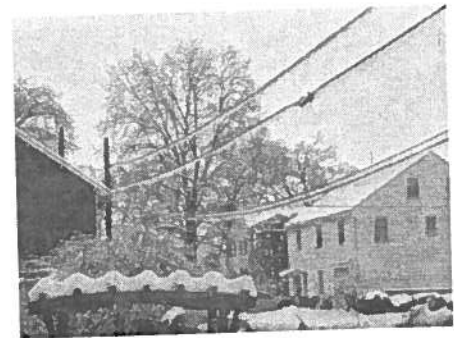
Generation



Transmission



Distribution

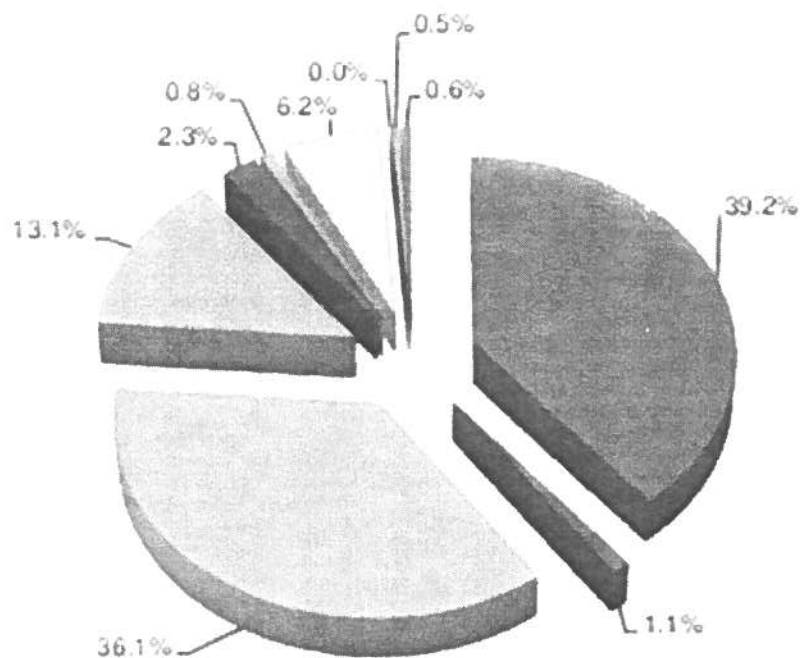


Generation

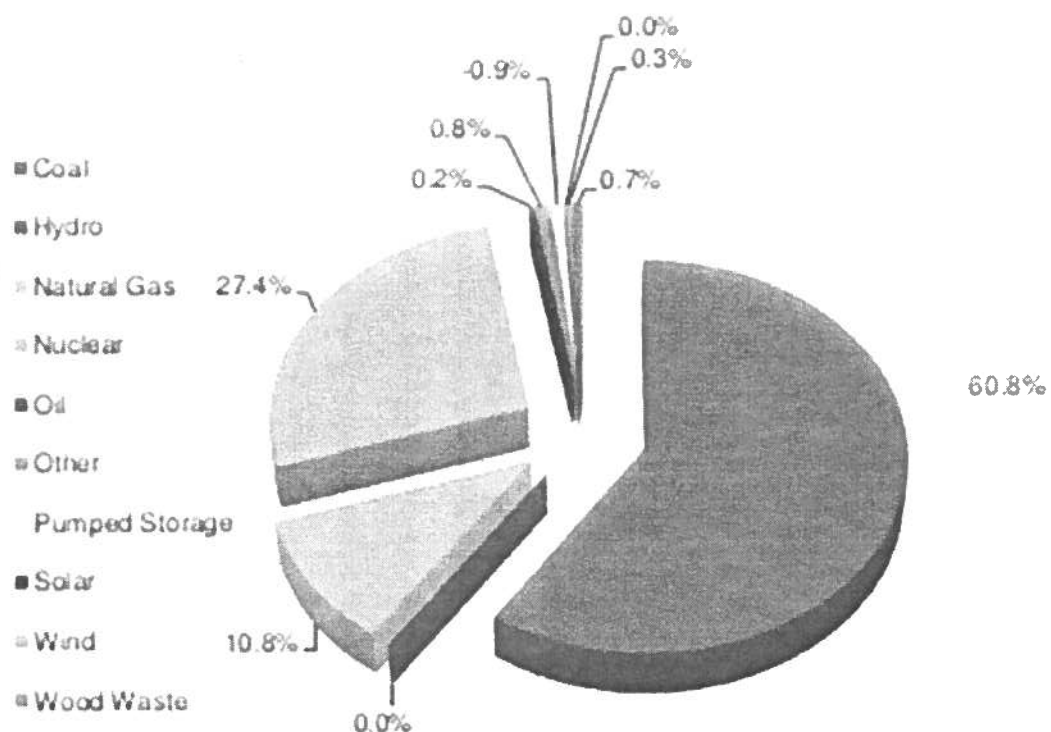
- Mix of “regulated” and “merchant” plants in Michigan
 - Majority of MI generation is regulated (owned by utilities that are required to serve and receive rate of return)
 - Most merchant plants are natural gas or renewables; biggest merchant is Palisades nuclear plant
- All plants bid into a multi-state power market on a daily basis; may run at a loss at some times of day

2010: Our Plants, Our Use

2010 Generation Capacity
Expressed as % by Type

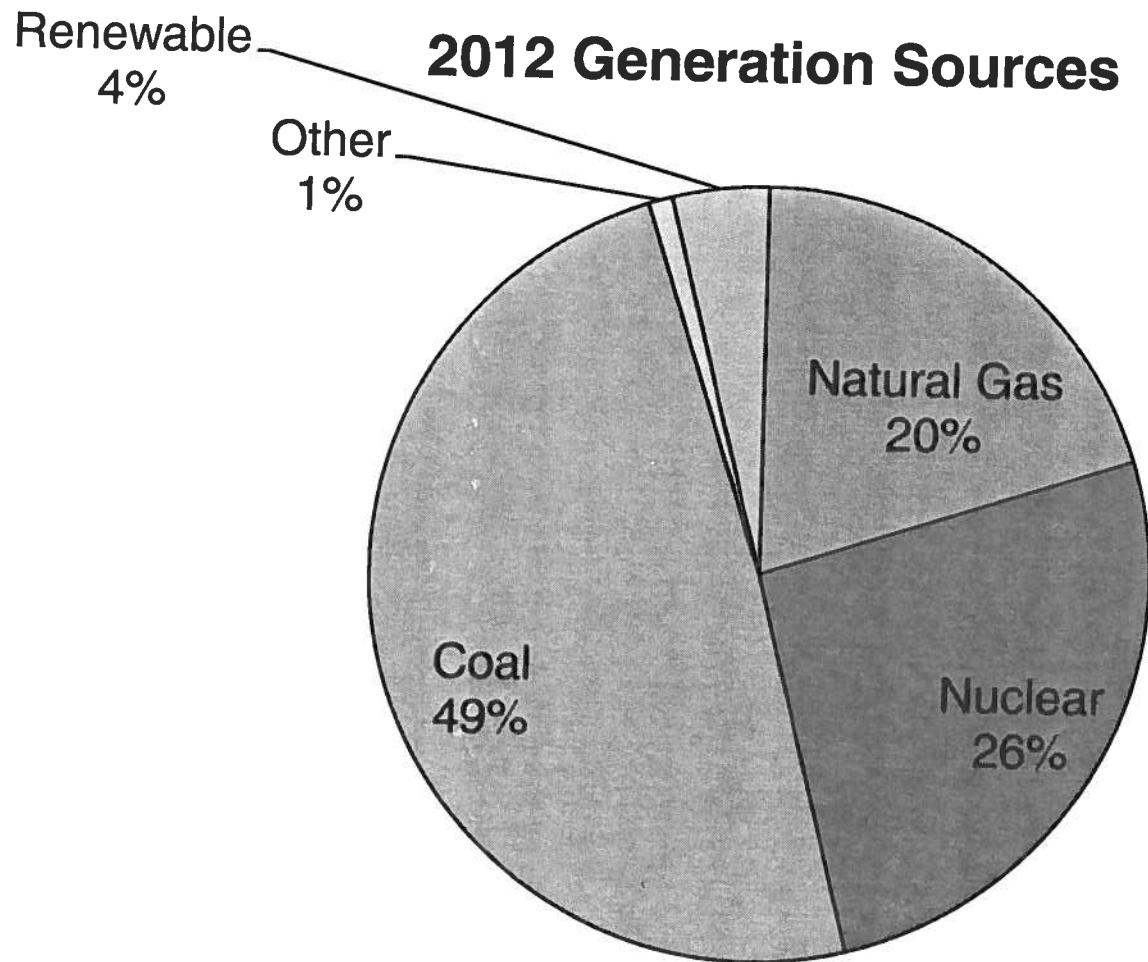


2010 Actual Generation
Expressed as % by Type



Source: Ventyx

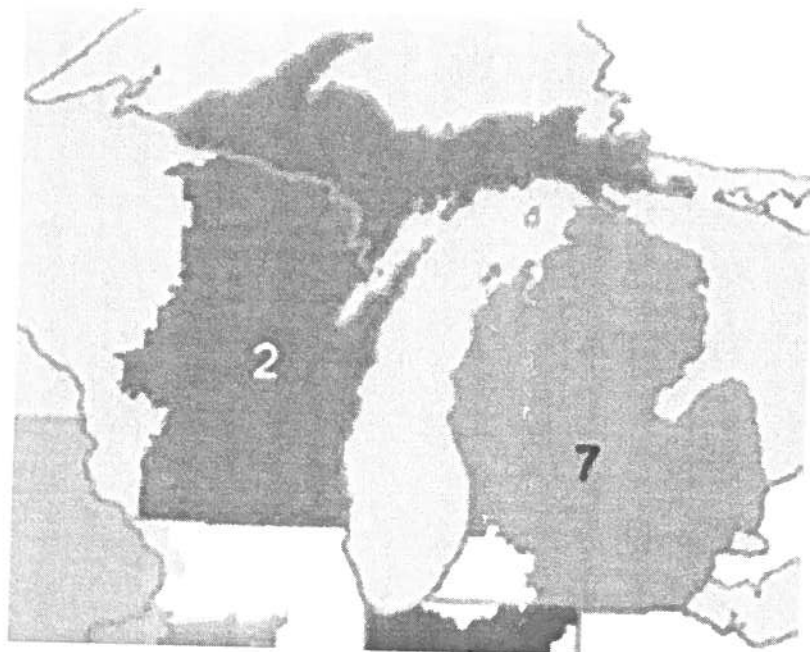
2012: Our Use



Transmission

- Comparable to major highways of the electrical system; always a monopoly
- With exceptions, MI has two major providers:
 - Upper Peninsula: ATC (American Transmission Company)
 - Lower Peninsula: ITC (International Transmission Company)
- Managed by “Independent Systems Operator” -- MISO or PJM in Michigan; overseen by Federal Energy Regulatory Commission

MISO Map



- White area is PJM (served by Indiana-Michigan Power).
- Lower Michigan is mostly in Zone 7 of MISO
- UP is part of Zone 2 of MISO

Distribution

- This is who you write your check out to; always a monopoly
- Two non-profit types of utilities in Michigan:
 - Municipal (e.g. Holland, Lansing, Marquette)
 - Cooperative (e.g. Cloverland, Great Lakes, Wolverine)
 - Mostly self-regulated
- For-profit or Investor-Owned Utilities
 - Most common type of utility in Michigan (e.g. DTE, Consumers)
 - Regulated by Michigan Public Service Commission

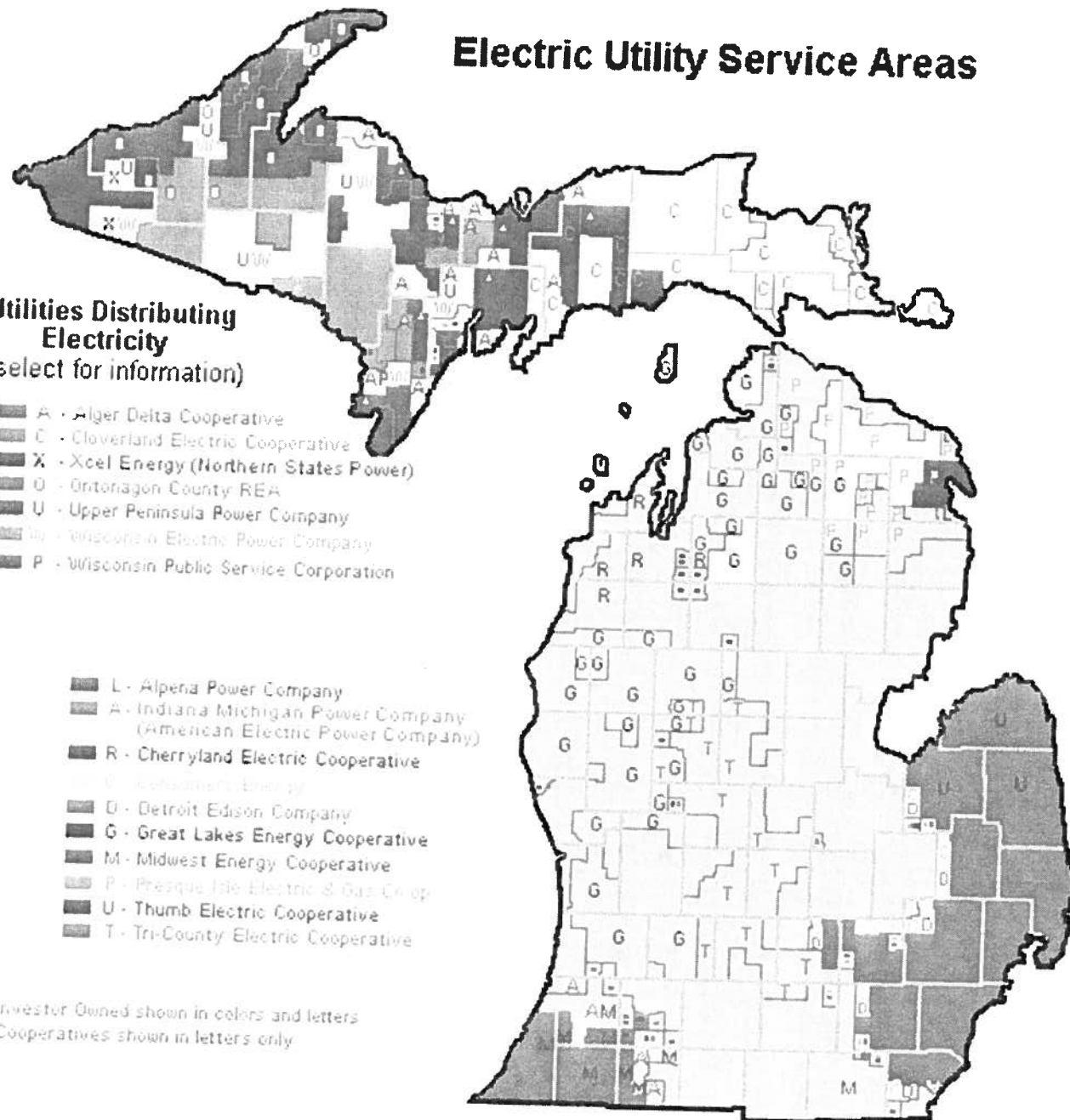
Electric Utility Service Areas

Utilities Distributing Electricity
(select for information)

- A - Alger Delta Cooperative
- C - Cloverland Electric Cooperative
- X - Xcel Energy (Northern States Power)
- O - Ontonagon County REA
- U - Upper Peninsula Power Company
- W - Wisconsin Electric Power Company
- P - Wisconsin Public Service Corporation

- L - Alpena Power Company
- A - Indiana Michigan Power Company (American Electric Power Company)
- R - Cherryland Electric Cooperative
- D - Schumacher Energy
- D - Detroit Edison Company
- G - Great Lakes Energy Cooperative
- M - Midwest Energy Cooperative
- P - Presque Isle Electric & Gas Corp.
- U - Thumb Electric Cooperative
- T - Tri-County Electric Cooperative

Investor Owned shown in colors and letters
Cooperatives shown in letters only



Big Issue: Electric Supply

- Several EPA rules taking effect in 2016-2020
 - Nine coal plants in lower Michigan slated to close
 - Only major generating plant in UP slated to close
- If there is not enough supply for everyone, no one gets power (massive power grid failure a la 2003 in LP)
- When not enough generation is available to keep lights on, Washington DC steps in
 - Forces utilities running plants, takes over normal state role in overseeing compensation for the utilities
 - Forces build of new transmission lines if needed for reliability (cannot force building of new generation even if far better solution)

Resources

- www.michigan.gov/energy
 - Administration's goals homepage
 - History tab contains reports that were done to answer a lot of questions people had related to energy issues, especially policies adopted in 2008. Summarizes comments from differing points of view.
 - Also is a workgroup report regarding rates for energy-intensive users
- Public Service Commission

Lots More to Talk About

- Natural gas utilities
- How rates, safety, etc. are regulated
- 2008 energy law major components
 - Market structure, energy waste, and renewable generation
 - Cost-of-service principles
- Even more EPA rules coming this year (ozone, carbon)
- UP situation & likely solution